Supplement to Electrical and Electronic Trader
25 October 1968

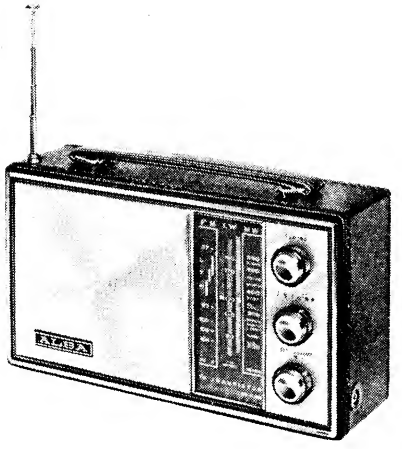
Trader
Service
Sheet

Alba 131L

1877

A.M./F.M. battery operated portable radio receiver

Circuit diagram of the Alba 131L radio receiver. Component numbers used in the circuit diagram and tables, correspond with those used in the manufacturer's service manual, with exception of the switches.



Three-quarter view of the Alba 131L with telescopic aerial partially extended.

Introduction

Alba model 131L is a ten transistor and seven semi-conductor diode, three waveband a.m./f.m. portable radio receiver. A feature of the circuit is the inclusion of an a.f. pre-amplifier when switched to v.h.f./f.m.

Wavebands covered by this receiver are: l.w. 857-2,000m, m.w. 187-567m and v.h.f./f.m. 87-104Mc/s. An internal ferrite rod aerial is used for reception in the long and medium wavebands, a telescopic aerial for v.h.f. No provision is made for the connection of an external aerial.

A maximum audio output of 500mW is handled with a 4in dia loudspeaker of 8Ω impedance which is in series with a normally closed miniature jack. This jack is used for the connection of an earphone or external loudspeaker of impedance not less than 8Ω. The internal loudspeaker being muted on insertion of a miniature jack plug.

(Continued overleaf col. 1)

Transistor table

Transistor		A.M. Emitter (V)	Base (V)	Collector (V)	F.M. Emitter (V)	Base (V)	Collector (V)
TR1	2SA440	5·3	5·0	—	4·7	4·2	—
TR2	2SA440	5·2	5·2	—	3·7	3·4	—
TR3	2SA324	4·2	4·0	0·04	3·3	3·0	0·13
TR4	2SA321	5·0	4·7	0·06	4·5	4·1	0·12
TR5	2SA321	4·6	4·1	0·17	4·0	3·6	0·24
TR6	2SB185	3·2	2·6	0	3·0	2·4	0
TR7	2SB185	4·7	4·4	1·5	4·3	4·0	1·4
TR8	2SB186	4·1	3·9	0·3	4·1	3·9	0·3
TR9	2SB22	5·98	5·8	2·9	5·98	5·8	2·9
TR10	2SB22	2·88	2·7	0	2·88	2·7	0

Component values and locations

Resistors

R1	220Ω	A1
R2	2·2kΩ	A1
R3	5·6kΩ	B1
R4	33kΩ	A1
R5	1·8kΩ	A1
R6	2·2kΩ	A1
R7	5·1kΩ	A1
R8	2·2kΩ	B2
R9	82kΩ	B1
R10	10kΩ	B1
R11	680Ω	B1
R12	150Ω	B1
R13	5·6kΩ	B2
R14	1kΩ	B2
R15	220Ω	B2
R16	270Ω	B2
R17	560Ω	B2
R18	1·5kΩ	B2
R19	1kΩ	B2
R20	1kΩ	B2
R21	10kΩ	B2
R22	1kΩ	B2
R23	100kΩ	B2
R24	100kΩ	B2
R25	3·3kΩ	B2
R26	15kΩ	B1
R27	4·7kΩ	B1
R28	3·3kΩ	B1
R29	15kΩ	B1
R30	100Ω	A1
R31	2·2kΩ	B1
R32	15kΩ	B1
R33	47kΩ	A2
R34	10kΩ	A2
R35	1kΩ	A2
R36	68Ω	A2
R37	2·2kΩ	A2
R38	10kΩ	A2
R39	3·9kΩ	A2
R40	390Ω	A2
R41	56Ω	A2
R42	1kΩ	A2
R43	68Ω	A1
R44	1kΩ	A1
R45	68Ω	A1
R46	2·2Ω	B2
R47	2·2Ω	A1
R48	56kΩ	A2
R49	3·9kΩ	B2
R50	100Ω	A1
R51	1·5kΩ	A2
R52	330kΩ	B1
VR1	100kΩ	A1
VR2	100kΩ	B2
VR3	10kΩ	A2

Capacitors

C2	0·01μF	A1
C3	0·02μF	A1
C4	80pF	A1
C5	1,000pF	A1
C6	5μF	A1
C7	10pF	A1
C8	3pF	A1
C9	5pF	A1
C10	500pF	A1
C11	25pF	A1
C12	1,000pF	A1
C13	12pF	A1
C14	40pF	B1
C15	5pF	B1
C16	20pF	B1
C17	10pF	B1
C18	0·01μF	B1
C19	5,000pF	B1
C20	0·01μF	A1
C21	0·01μF	B1
C22	85pF	A1
C23	165pF	B1
C24	3,000pF	A1
C25	10pF	A1
C26	270pF	A1
C27	10μF	B1
C28	1,000pF	B1
C29	10pF	B1
C30	4pF	B1
C31	0·02μF	B1
C32	0·04μF	B1
C33	12pF	B2
C34	4pF	B2
C35	0·02μF	B2
C36	0·02μF	B1
C37	25pF	B2
C38	0·01μF	B2
C39	0·01μF	B2
C40	5μF	B2
C41	1,000pF	B2
C42	1,000pF	B2
C43	5μF	B2
C44	5,000pF	B2
C45	5μF	A2
C46	0·02μF	B2
C47	0·02μF	B2
C48	200μF	B2
C49	5μF	A2
C50	30μF	A1
C51	5μF	A2
C52	30μF	A2
C53	200μF	A2
C54	0·01μF	B2
C55	0·01μF	B2
C56	200μF	B2
C58	200pF	A2
C59	200pF	A2
C60	0·02μF	A1
C61	0·04μF	A1
C62	0·04μF	B1
C64	0·04μF	A2
C65	0·02μF	—
C66	10pF	B1
C67	200μF	B2
CT1	—	A1
CT2	—	A1
CT3	—	A1
CT4	—	A1
CT5	—	A1
CT6	—	A1
CV1	—	B1
CV2	—	B1
CV3	—	B1
CV4	—	B1

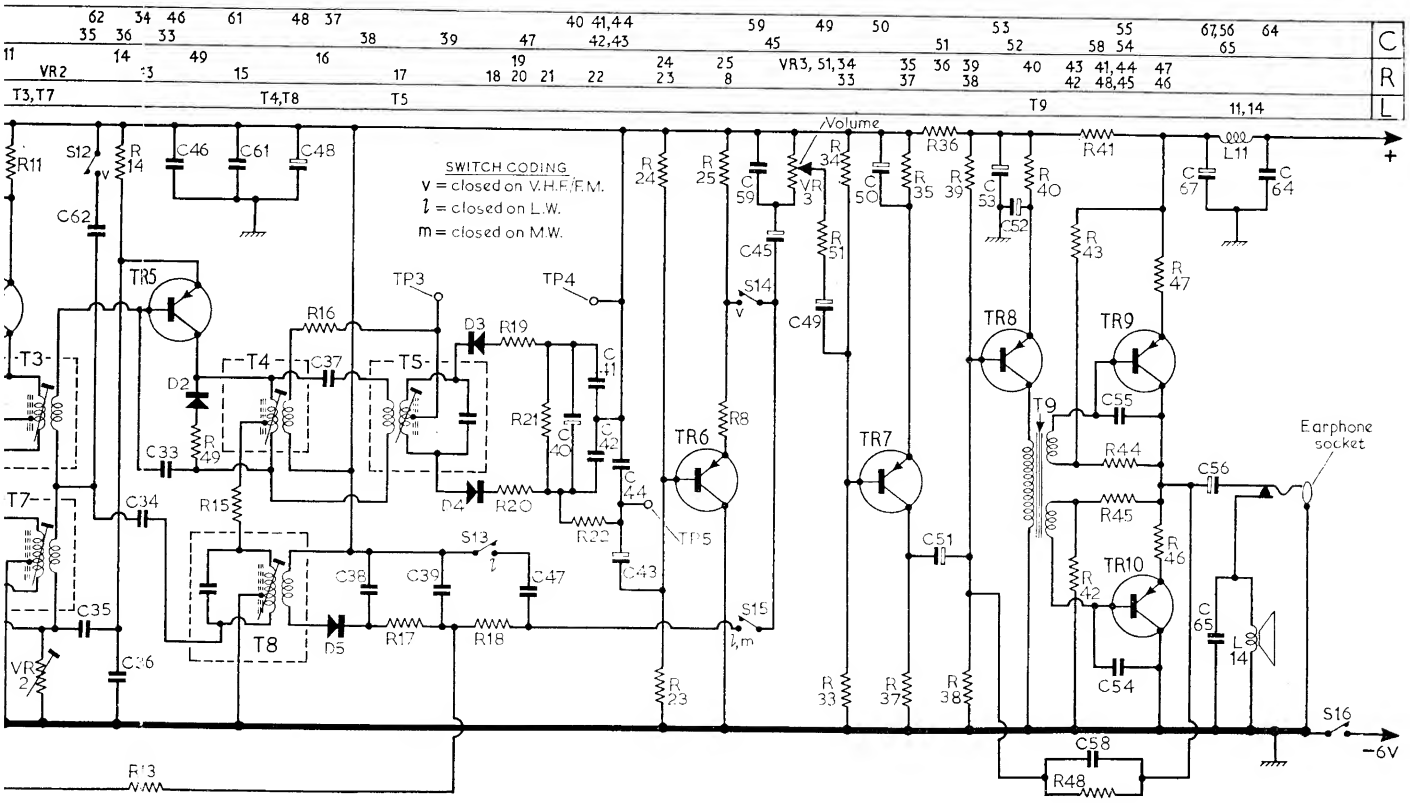
Coils and transformers

L1	—	A1
L2	—	A1
L3	—	A1
L4	—	A1
L5	—	B1
L6 a/b	—	†
L7	—	†
L8	—	†
L9	—	†
L11	—	A2
L12	—	A1
L13	—	A1
L14	8Ω	**
T1	—	B1
T2	—	B1
T3	—	B1
T4	—	B2
T5	—	B2
T6	—	B1
T7	—	B1
T8	—	B2
T9	—	A2

Miscellaneous

D2-D5	1S188	B2
D1, D6, D7	1S188	B1
S1-S15	—	B1
S16	—	A2

† *Ferrite rod aerial*
** *Loudspeaker*



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Continued from overleaf—

Operating power is supplied by four type LPU2 cells or their equivalent, the quiescent current is quoted as 19mA.

Transistor analysis

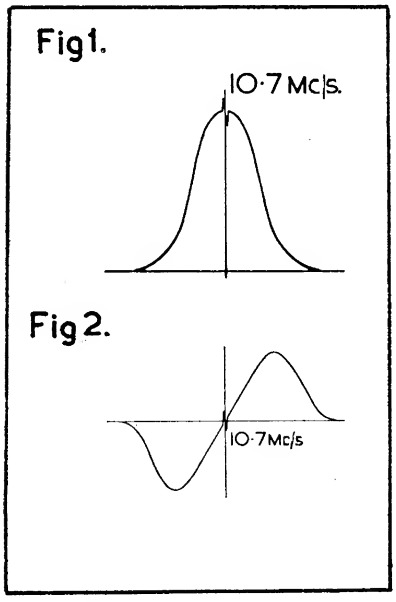
Transistor voltages quoted in the table overleaf were obtained from data supplied by the manufacturers. They were measured under quiescent conditions with a model 8 Avometer and are all positive with respect to battery negative.

Circuit alignment

Equipment required. – An r.f. signal generator covering the range 100kc/s-2 Mc/s amplitude modulated 30 per cent at 400c/s; an f.m. sweep generator with the following ranges: 10·7Mc/s deviated 300kc/s at 50c/s, 87Mc/s and 104Mc/s deviated 25kc/s at 1kc/s on each range; an r.f. coupling coil; an a.f. output meter to match 8Ω terminated with a miniature jack plug; an oscilloscope (c.r.o.); a shunt diode rectifier network made up with a 2,000pF capacitor, an OA79 diode and a 33kΩ resistor (see illustration col. 3), and one each 0·01 μF and 0·1 μF capacitors.

During a.m. alignment attenuate input signal so that the receiver output does not exceed 50mW thereby preventing a.g.c. action masking alignment peaks.

Switch on test equipment and allow approximately 15 minutes to warm up. Pre-set volume control to maximum and connect a.f. output meter via earphone jack. All a.m. i.f. and r.f. signals are fed in via the r.f. coupling coil which should be loosely coupled to the ferrite rod aerial assembly.



I.F. response curves.

1. – Switch receiver to m.w. and tune to 550m. Feed in a 470kc/s a.m. signal and adjust **T8, T7** and **T6** for maximum output. Repeat until no further improvement can be obtained.

2. – With receiver still tuned to 550m, feed in a 545kc/s a.m. signal and adjust **L13** and **L6a** (by sliding coil former along ferrite rod) for maximum output.

3. – Tune receiver to 200m and feed in a 1,500kc/s a.m. signal. Adjust **CT6** and **CT3** for maximum output.

4. – Repeat operations 2 and 3 until no further improvement can be obtained.

5. – Switch receiver l.w. and tune to 1,900m. Feed in a 158kc/s a.m. signal and adjust **L12** and **L8** (by sliding coil former along ferrite rod) for maximum output.

6. – Tune receiver to 900m and feed in a 333kc/s a.m. signal. Adjust **CT5** and **CT4** for maximum output.

7. – Repeat operations 5 and 6 until no further improvement can be obtained. Disconnect a.m. signal generator.

8. – Switch receiver to v.h.f./f.m. and tune to a signal free position in the waveband. Connect the f.m. sweep generator via a 0·01 μF capacitor to **TP2** and chassis **(TP1),** and the c.r.o. via the diode network to **TP3** and chassis. Detune **T5.**

9. – Feed in a 10·7Mc/s signal deviated 300kc/s at 50c/s. Adjust **T4, T3, T2** and **T1** for maximum amplitude, symmetrical about 10·7Mc/s (see Fig.1). Attenuate input signal so that response amplitude is just large enough to produce a recognizable pattern.

10. – Disconnect and remove diode network, then connect c.r.o. via a 0·1 μF capacitor to **TP5** and chassis.

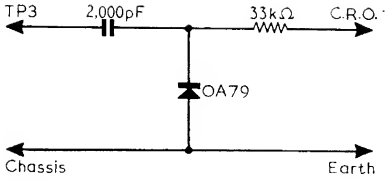
11. – Feed in a 10·7Mc/s signal 300kc/s at 50c/s. Adjust **T4** for a symmetrical 'S' curve, and **T5** to centre 10·7Mc/s marker in the straight portion of the curve (see Fig. 2).

12. – Repeat operations 9-11 for optimum response. Disconnect c.r.o.

13. – Tune receiver to 87Mc/s pre-set volume control to maximum and feed in an 87Mc/s f.m. signal deviated 25kc/s at 1kc/s. Adjust **L5** and **L3** for maximum output.

14. – Tune receiver to 104Mc/s and feed in a 104Mc/s f.m. signal deviated 25kc/s at 1kc/s. Adjust **CT2** and **CT1** for maximum output.

15. – Repeat operations 13 and 14 until no further improvement can be obtained.



Shunt diode network.

Sensitivity

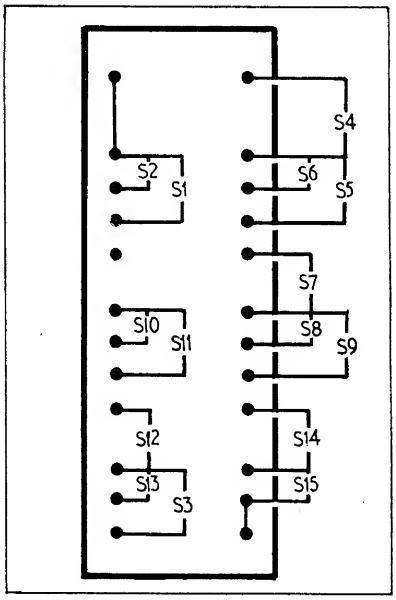
M.w./a.m. sensitivity for 50mW output. – 1Mc/s a.m. signal via a 5,000pF capacitor to **TR3** base: 7μV, 470kc/s a.m. signal via a 0·1 μF capacitor to the following stages: **TR3** base 3μV., **TR4** base 80μV., **TR5** base 1·4mV, **D5** anode 35mV.

V.h.f./f.m. sensitivity for 0·5V across **C40**—90Mc/s c.w. via a 0·1 μF capacitor to **TP2** 56μV. 10·7Mc/s c.w. via a 5pF capacitor to the following stages: **TR2** emitter 11mV., **TR3** base 14mV., **TR4** base 90mV., **TR5** base 180mV. For a 50mW output, a 90Mc/s signal deviated 25kc/s at 1kc/s fed via a 0·1 μF capacitor to **TP2**: 3·5μV.

Dismantling

Remove control knobs (pull off), then with reference to the sketch illustrating component locations on printed panel, unscrew and remove four screws and washers 'A'. The lower right hand screw secures fibre board shield. Unscrew and remove screw 'B' from bottom of case, then unsolder v.h.f./f.m. aerial lead at printed panel end. The chassis may now be lifted clear of case.

When replacing chassis make sure that the fibre washer between printed panel and the top right hand fixing pillar is in position.

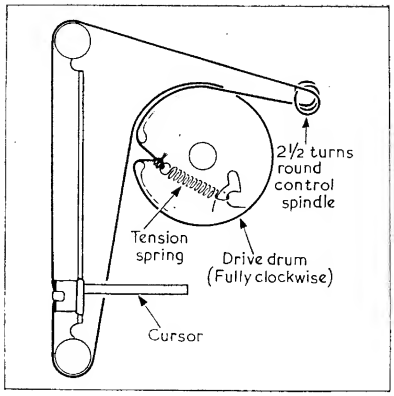


Waveband switches, **S1-S15.**

General notes

Drive cord replacement. – To replace drive cord remove chassis as described under "Dismantling". Prepare a suitable length of drive cord and with the tuning drum rotated fully clockwise route the cord as illustrated in sketch (right), making 2½ turns anti-clockwise (winding from the rear) around the control spindle.

Adjustments. – Switch receiver to v.h.f./f.m. and adjust **VR1** for 0·13V measured across **R1.** Switch receiver to m.w. and adjust **VR2** for 0·06V measured at **TR4** collector. Note: Both these measurements were made under quiescent conditions.



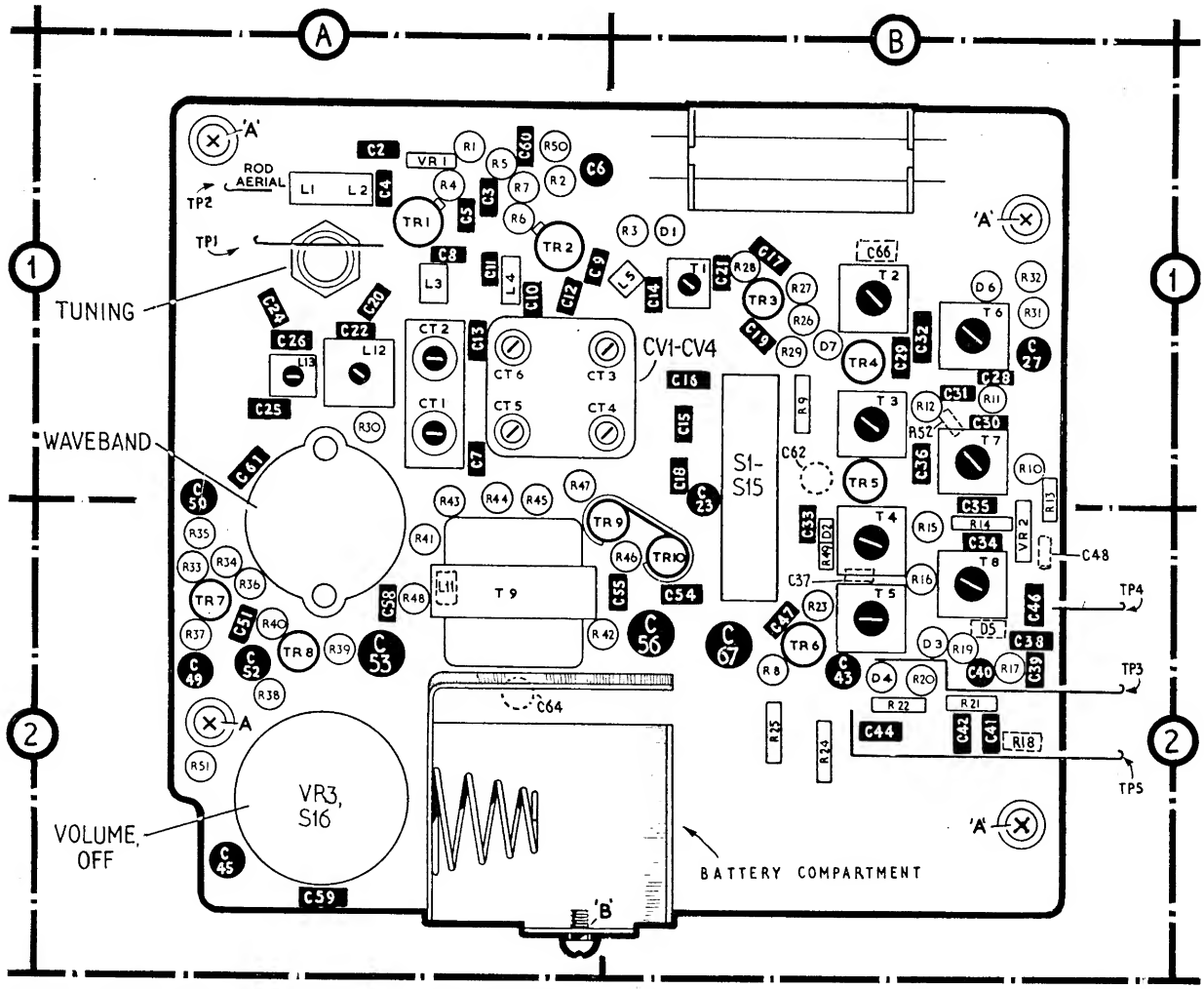
Sketch of the drive cord assembly.

Additional notes and modifications

Manufacturer's service department

Alba (Radio and Television) Limited,
52-70, Tabernacle Street,
London, E.C.2.

(Telephone: CLErkenwell 1322)



Component side view of the printed panel as seen from rear of the receiver.

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